

(19) World Intellectual Property
Organization
International Bureau



552032

(43) International Publication Date
21 October 2004 (21.10.2004)

PCT

(10) International Publication Number
WO 2004/090977 A1

(51) International Patent Classification⁷: **H01L 23/31**,
23/373, 23/495

(21) International Application Number:
PCT/EP2004/003750

(22) International Filing Date: 8 April 2004 (08.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
103 16 136.8 9 April 2003 (09.04.2003) DE

(71) Applicant (for all designated States except US): **IXYS
SEMICONDUCTOR GMBH** [DE/DE]; Edisonstrasse
15, 68623 Lampertheim (DE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LINDEMANN, An-
dreas** [DE/DE]; Martin-Kärcher-Strasse 30, 68623 Lam-
pertheim (DE).

(74) Agents: **OPPERMANN, Frank et al.**; John-F.-Kennedy-
Strasse 4, 65189 Wiesbaden (DE).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

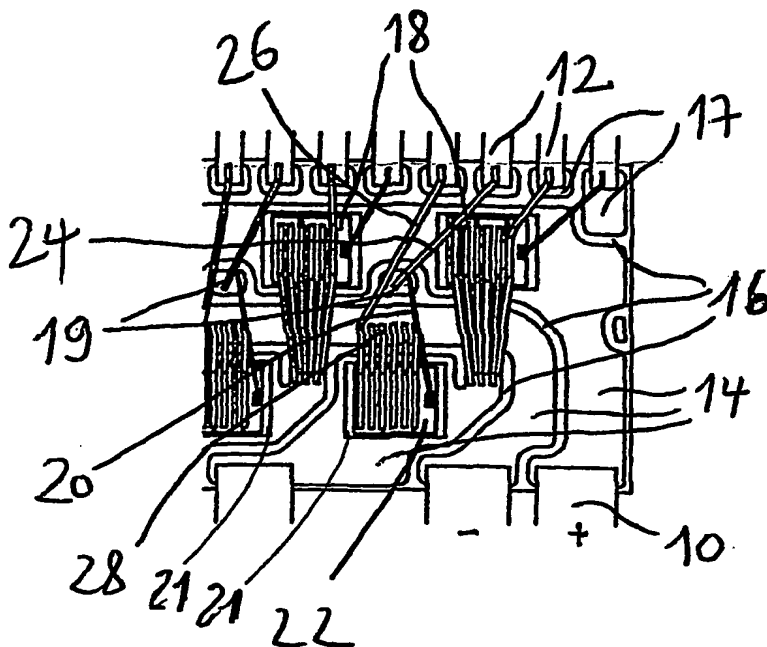
— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: **ENCAPSULATED POWER SEMICONDUCTOR ASSEMBLY**



(57) Abstract: The invention relates to an encapsulated power semiconductor assembly comprising a substrate consisting of an insulation material (ceramic), provided with a plurality of islands (14, 17, 18, 19), which are composed of a thermal conductive material, in particular of partial surfaces of a metal layer. Power semiconductor chips (22) are soldered onto said islands. Electric connections that run from the chips to the connecting elements (10 and 12) are produced in the form of bonding pads (20, 24) on additional islands or in the form of wires (28) and islands (14) that are configured as printed conductors. The substrate and the chips are encapsulated, whereas the connection elements (10 and 12) project beyond said encapsulation and the metallic underside of the substrate is exposed in order to be fastened to a heat sink.

WO 2004/090977 A1